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ABSTRACT

The Schools and Staffing Survey (SASS) is an integrated set of surveys that has been conducted by the U.S. Census Bureau for the National Center for Education Statistics (NCES) in 1987-88, 1990-91, and 1993-94. In each of those school years, the Census Bureau also conducted a reinterview of the administrators, schools, and teachers. This report contains the reinterview results from the 1993-94 school year. The reinterviews evaluated a subset of survey questions for response variance. Thirty-nine percent of the questions evaluated in the Teacher Survey displayed high response variance, but most questions evaluated from the school survey displayed low response variance. Almost half of the questions evaluated in the reinterview for the administrator survey displayed high response variance. Only a handful of questions from the surveys have been evaluated through reinterview, and the NCES and the Census could achieve more benefits from the reinterview program if the reinterview evaluation and survey improvement efforts were more closely linked. Suggestions are made to accomplish this linkage. An attachment contains the response variance formula. (SLD)

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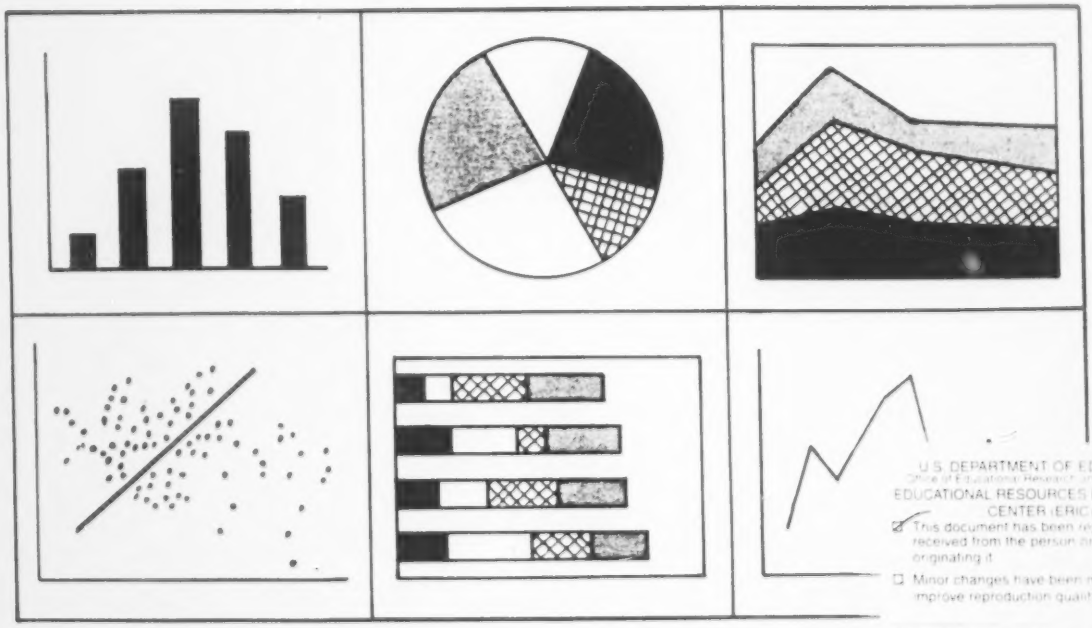
Response Variance in the 1993-94 Schools and Staffing Survey: A Reinterview Report

Working Paper No. 98-02

January 1998



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Response Variance in the 1993-94 Schools and Staffing Survey: A Reinterview Report

Working Paper No. 98-02 January 1998

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January 1998

Foreword

Each year a large number of written documents are generated by NCES staff and individuals commissioned by NCES which provide preliminary analyses of survey results and address technical, methodological, and evaluation issues. Even though they are not formally published, these documents reflect a tremendous amount of unique expertise, knowledge, and experience.

The ***Working Paper Series*** was created in order to preserve the information contained in these documents and to promote the sharing of valuable work experience and knowledge. However, these documents were prepared under different formats and did not undergo vigorous NCES publication review and editing prior to their inclusion in the series. Consequently, we encourage users of the series to consult the individual authors for citations.

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Response Variance in the 1993-94 Schools and Staffing Survey: A Reinterview Report

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January 1998

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I. Summary

The National Center for Education Statistics (NCES) sponsors the Schools and Staffing Survey (SASS) conducted by the U.S. Census Bureau. The SASS is an integrated set of surveys including the Teacher, School, and Administrator Surveys. The Census Bureau first conducted the SASS during the 1987-88 school year and again during the 1990-91 and 1993-94 school years. During each of the three school years the Census Bureau also conducted a reinterview of the administrators, schools, and teachers. This report contains the reinterview results from the 1993-94 school year. Previous reports contain the reinterview results from the 1987-88 and 1990-91 school years [1], [2].

In each of the three surveys, the reinterview evaluated a subset of questions for response variance. The NCES considered these critical to the survey or suspected they were problematic. High response variance in a question is very problematic—more of the variability in the data comes from response error than from differences between respondents. Moderate response variance in a question is somewhat problematic, especially when two variables are cross-tabulated.

A. Major Findings and Recommendations

1. The Teacher Survey

Thirty-nine percent of the questions evaluated in the Teacher Survey displayed high response variance. In particular, teachers were unable to answer consistently the questions about teaching assignments and certification. These questions refer to the teacher's "main field" and "other" teaching fields. The questions alternate between the main field and the other field, possibly confusing respondents. For example, teachers who reported teaching no classes in "other fields" should always have marked "not applicable" to the question about teaching certificates in their "other field." About one-fourth of these teachers failed to do so.

Part 1 of the 1992 Teacher Follow-up Survey (TFS) Reinterview Report [3] made specific recommendations to improve these questions.

- Ask the questions about the "main" teaching assignment in a single battery, not interspersed with questions about "other fields."
- Ask a similar battery of questions about "other" teaching assignment fields after completing the "main assignment" questions.

We suggest these improvements be implemented in the 1999-2000 SASS Teacher Survey and in the 2000 TFS.

2. The School Survey

Most questions evaluated in the school survey displayed low response variance. However, the questions on "school policies" were markedly less reliable. None of these questions displayed low response variance. This battery of questions is complex and we cannot point to any single cause of response variance. It might be that the topic itself is too complex or that school policies are too ill-defined for respondents to answer the questions reliably. Most likely, several causes are operating simultaneously, including imperfect question design. We suggest some possible causes for the problematic response variance in these questions.

Complex questions, which combined two or more concepts, and undefined terms or concepts probably generated some response variance in these questions.

Question 31a/46a illustrates the problem of complex questions with combined concepts: "Does this school have a drug, alcohol, and/or tobacco use preventive program?" Combining programs for preventing the use of three substances may result in inappropriate negative responses if the school lacks a preventive program for one of the substances. Asking a separate question for each substance may yield more reliable data. The combination of "policy and enforcement" in question 31b/46b is another example of how combining two concepts in one question may hurt reliability. Although separate questions are asked for the three substances, the indexes are all in the forties—moderately problematic. Finally, using the "mark all" question format is seldom a good idea. Previous work has shown that the "mark all" format leads to questionable data [4] [5]. All the questions in this section with high response variance were "mark all" categories.

3. The Administrator Survey

Almost half the questions the reinterview evaluated in the Administrator Survey displayed high response variance. And almost all the questions with high response variance were opinion or perception-type questions. This type of question often shows poor reinterview reliability because the respondent may change opinions or perceptions between the two interviews. When evaluating such questions in a reinterview we cannot distinguish between poor reliability caused by changing opinions or perceptions and poor reliability caused by flawed question design. Internal consistency measures, such as Cronbach's alpha [6], might prove useful in evaluating how reliably the questions measure the underlying concepts.

B. Overall Recommendation

In preparing this report and a paper based on this report [7], we realized that the NCES and Census can achieve even more benefits from the reinterview program than we have seen to date. We noticed that only a handful of questions, from all three surveys combined, have been evaluated, revised through cognitive research, and evaluated again in the next SASS. To begin a more effective program of continual improvement for the SASS questionnaires, the NCES and Census should jointly develop a plan that more closely links the reinterview evaluation and improvement efforts. This process would follow the "Deming cycle" for continual improvement.

To better implement continual improvement, we recommend that the NCES and Census (including representatives from DSD, CSMR, and DSMD)

- Discuss these findings, target specific problematic questions for improvement, and commit to reevaluate these questions in the next SASS cycle.
- Employ cognitive experts to determine the root causes of error and to recommend improvements for these questions.
- Reevaluate these questions in the next SASS cycle.
- Repeat this cycle to continue achieving improvement.

II. Methodology

A. Reinterview Procedures

In the SASS reinterviews we replicated the original interview's mode. If the original interview was completed by mail, the reinterview was completed by mail. If the original interview was completed by CATI, the reinterview was completed by CATI. We emphasized the importance of reinterviewing the same respondent who completed the original interview. Reinterviewing the same respondent isolates reliability problems in the questions and eliminates discrepancies caused by interviewing two different people. This factor was important in the Schools Survey, where otherwise different office staff might have completed the original interview and the reinterview. We reinterviewed the same respondent 80 percent of the time. We reinterviewed a different respondent 13 percent of the time, and The reinterview respondent name was not provided 7 percent of the time.

At least once a week the Data Preparation Division (DPD) in Jeffersonville, Indiana received a list of completed original mail questionnaires. Within a week of receiving the list, DPD mailed out the reinterview questionnaires. Accounting for the time needed for questionnaires to travel back and forth by mail, we estimate that most mail respondents received reinterview questionnaires within

three to four weeks after completing the original interview. The CATI centers generally conduct reinterviews within one to two weeks after the original interview.

B. Reinterview Sample Design and Response Rates

The reinterview sample for each of the SASS surveys was a random subsample of that survey's full sample. The reinterview sample was selected at the same time as the original survey sample. We aimed to obtain 1,000 completed reinterviews for each survey.

We selected enough extra sample to account for original sample cases that were noninterviews, out of scope, or interviewed in the field. Unfortunately, we underestimated the number of field interviews needed. Instead of the 2 percent we planned on, field interviews accounted for:

- 13.6 percent of the completed interviews in the Teacher Survey.
- 29.4 percent of the completed interviews in the School Survey.
- 6.8 percent of the completed interviews in the Administrator Survey.

1. The Teacher Survey

We completed 926 Teacher Survey reinterviews—688 mail cases and 238 CATI cases. The reinterview response rate was 73.4 percent. Table 1 shows the reinterview sample sizes and response rates for the public and private school teachers.

Table 1. 1993-1994 SASS Teacher Survey Reinterview Sample Sizes and Response Rates

Cases	Total	Teachers	
		Public	Private
Selected for RI	1682	1423	259
Noninterview in Original	146	101	45
Out-of-scope	76	57	19
Original interview completed	1460	1265	195
Original completed in the field	199	166	33
Eligible for RI	1261	1099	162
RI completed	926	804	122
Mail	688	604	84
CATI	238	200	38
RI response rate	73.4%	73.1%	75.3%
Mail	69.5%	69.3%	71.2%
CATI	87.8%	88.1%	86.4%

2. The School Survey

We completed 555 School Survey reinterviews—378 mail cases and 177 CATI (public schools only) cases. The reinterview response rate was 61.7 percent. Table 2 shows the reinterview sample sizes and response rates for the public and private schools.

The low reinterview response rate and the high rate of field interviews omitted from the School Survey reinterview leads us to suspect this evaluation may understate the level of response variance. We hypothesize that respondents requiring a field interview are less motivated than mail and CATI respondents. These reluctant respondents might be more likely to give "top of the head" answers simply to complete the interview quickly. We believe that respondents

originally interviewed, whom we could not reinterview, behave similarly. If all these respondents do provide less thoughtful answers, those answers are likely to contain more response error than the answers of respondents we could reinterview. Thus, this reinterview may underestimate the response variance in the School Survey.

Table 2. 1993-1994 SASS School Survey Reinterview Sample Sizes and Response Rates

Cases	Total	Schools	
		Public	Private
Selected for RI	1420	1033	387
Noninterview in Original	89	46	43
Out-of-scope	58	35	23
Original interview completed	1273	952	321
Original completed in the field	374	213	161
Eligible for RI	899	739	160
RI completed	555	467	88
Mail	378	290	88
CATI	177	177	-
RI response rate	61.7%	63.2%	55.0%
Mail	57.3%	58.0%	55.0%
CATI	74.1%	74.1%	-

3. The Administrator Survey

We completed 947 Administrator Survey reinterviews—711 mail cases and 236 CATI cases. The reinterview response rate was 81.8 percent. Table 3 shows the reinterview sample sizes and response rates for the public and private school administrators.

Table 3. 1993-1994 SASS Administrator Survey Reinterview Sample Sizes and Response Rates

Cases	Total	Administrators	
		Public	Private
Selected for RI	1329	975	354
Noninterview in Original	67	34	33
Out-of-scope	21	15	6
Original interview completed	1241	926	315
Original completed in the field	84	49	35
Eligible for RI	1157	877	280
RI completed	947	727	220
Mail	711	562	149
CATI	236	165	71
RI response rate	81.8%	82.9%	78.6%
Mail	80.7%	81.4%	78.0%
CATI	85.5%	88.2%	79.8%

C. Reinterview Model Assumptions

The response error reinterview model assumes the reinterview is an independent replication of the original interview.

Independence means that the response errors are not correlated between the original interview and the reinterview. If the respondents remembered their original answers and consciously repeated them in the reinterview, the independence assumption would be violated. Lack of independence generally results in underestimates of response variance.

Replication means that the reinterview was conducted under the same conditions as the original interview. If the reinterview replicates the original interview, the distribution of original and reinterview responses will be the same. With

quantitative data, neither the means nor the variances of the original responses will differ significantly from the reinterview responses. With categorical data, the difference between the original proportion in-category and the reinterview proportion in-category, the net difference rate (NDR), will not differ significantly from zero.

D. Measures Used to Estimate Response Variance

Random errors of measurement in the survey process (nonsampling error) increase the mean square error of the data collected. When the errors are not correlated with the answers or with each other, we call this variability "simple response variance."

The **index of inconsistency** and the **gross difference rate (GDR)** are the principal measures of response variance in categorical data. We estimate an index and a GDR for each response category of a question.

Overall estimates of the index and the GDR for a question, the **aggregate index** and the **aggregate GDR**, apply to questions with three or more answer categories.

We used **Pearson's correlation coefficient** to provide a measure of data reliability for quantitative variables. When all the response variance model assumptions are met, the index is approximated by one minus the correlation between the original and reinterview responses ($I = 1 - \rho$). When the means and variances for the two interviews are exactly the same, the index equals one minus the correlation.

Before computing the correlation for a question, we removed from one to five outliers. We identified outliers as cases where the respondent gave an original response two or more times greater than the reinterview response, or vice versa.

This report provides 90 percent confidence intervals for these measures. See Attachment A for the formulas we used to calculate the measures and the confidence intervals.

1. Index of Inconsistency

The index of inconsistency estimates the ratio of response variance to total variance for a question answer. It is a relative measure of response variance.

The aggregate index is similar to the index of inconsistency but applies to the entire question rather than a specific answer category of the question. It is an average index of inconsistency across all categories in the question, with each category weighted by its relative size. In 2 × 2 tables the index of inconsistency and the aggregate index are equal. Attachment A provides the formula for the aggregate index.

Use this rule of thumb to interpret the index of inconsistency and the aggregate index.

Index Value	**Response Variance**	**Interpretation**
Less than 20	Low	Usually not a major problem
Between 20 and 50	Moderate	Somewhat problematic
Greater than 50	High	Very problematic

Any of these factors may cause high response variance:

- The methods used to collect the data need improvement or the question may be unclearly written.
- The concept itself may not be measurable or difficult to measure.
- Respondents may not be able to provide reliable information to the level of detail asked.

2. Gross Difference Rate

The gross difference rate (GDR) is the percentage of responses that fall in a category in the original interview but not in the reinterview, or vice versa. For a single category, one-half the GDR equals the simple response variance.

The aggregate GDR is the percentage of responses that change between the original interview and the reinterview. It applies to the entire question, rather than to a specific answer category of the question.

The GDR is more difficult to interpret than the index of inconsistency. Large GDRs indicate serious response variance in the data. Unfortunately, a small GDR is no guarantee of good consistency. In a low-frequency category, even a small GDR can represent high response variance, relative to total variance.

3. Net Difference Rate

With categorical data, the **net difference rate (NDR)** helps indicate how well the reinterview meets the model assumptions. A statistically significant NDR suggests that the reinterview may not replicate the original survey conditions as well as desired.

With quantitative data, a comparison between the original interview and reinterview means and variances provide information analogous to the NDR.

4. Cross-Tabulations

For a "yes/no" question, the cross-tabulation looks like this:

Reinterview Response	**Original Response**				
	Total	N/A	Subtotal	Yes	No
Total					
N/A					
Subtotal			n	a + c	b + d
Yes			a + b	a	b
No			c + d	c	d

where

n = the number of respondents who answered the question in both the original and the reinterview.
a = the number of respondents who answered "yes" both times.
b = the number of respondents whose answer changed from "no" in the original to a "yes" in the reinterview.
c = the number of respondents whose answer changed from "yes" in the original to a "no" in the reinterview.
d = the number of respondents who answered "no" both times.

We used only cases that respondents answered the question in both the original interview and reinterview to compute the response variance measures.

In multi-category questions, these cross-tabulations show the movement among answer categories between the original interview and the reinterview. Patterns in this movement can provide clues to the reasons for inconsistent reporting. In some cases, such movement may even suggest question revisions to reduce response variance.

The Census Bureau generally does not compute the index for answer categories with small cell sizes. The Bureau uses the following rule to determine adequate cell size [6].

$2a + b + c \geq 40$ and $2d + b + c \geq 40$

In reviewing the documentation, we have determined that this "40 Rule" was developed to eliminate manual computations when the index has a very wide confidence interval. Current computing resources make this restriction irrelevant and we plan to drop it from future analyses.

With quantitative data, we arbitrarily set the minimum sample size at 50 cases. Table 4 lists those questions that did not have enough cases to compute indices for the teacher, school, and administrator questionnaires.

Table 4. Questions with Too Few Cases to Analyze

Questionnaire	Questions with Too Few Cases
Teacher	1b, 22b (private), 23b (private), 24b(3), 24b(5), 24b(7), 30-0 (public), 30-2 (private), 30-6 (private), 30-0 (private), 50b(2), 54-5 , 54-9, 54-10, and 54-0
School	21 (b,c,d,e,f,h), 22 (d,e,g,h), 24c -- all private school questions; 46b1/31b1, 46b2/31b2, and 46b3/31b3
Administrator	14b1(5), 14b2(5), 18c1 (private), 19b1, 19b2, and 25c2 (private)

E. Limitations

The high proportion of field interviews dropped from the reinterview, especially in the School Survey, and low reinterview response rates in the School Survey may result in underestimates of response variance, as discussed earlier.

We computed the response variance measures using unweighted counts and estimated the confidence intervals assuming simple random sampling. These estimates, therefore, do not account for the complex sample design of the SASS

surveys and may not perfectly reflect the incidence of response error in the target populations of teachers, schools, and administrators.

The Teacher, School, and Administrator reinterviews may not have been independent of the original interviews, to the extent respondents remembered and repeated their answers from the original interview.

The reinterviews may not always have replicated the original interviews. In particular, in the Teacher and Administrator surveys, the proportions of questions and subquestions with statistically significant NDRs are higher than the 10 percent we would expect by chance. Specifically, 40 percent of the 137 response categories and subquestions evaluated in the Teacher Survey reinterview and 33 percent of the 197 response categories and subquestions in the Administrator Survey reinterview displayed statistically significant NDRs. Some of these significant NDRs were caused by a "context effect" in the reinterview. In the Administrator survey, the first several questions asked about bachelor's degrees. The reinterview did not include any of the bachelor's degree questions. The first question in the reinterview asked for the administrator's master's degree. We found that many of the administrators reported the same major field of study for their master's degree in the reinterview as they reported for their bachelor's degree in the original interview.

Other significant NDRs may have occurred because of an attempt to save money. The reinterview used only a single questionnaire for both public and private school teachers, schools, and administrators, while the original interview used separate questionnaires to collect data for public and private schools. This lack of replication contributed to the skip pattern errors in the reinterview. It also may have generated a different distribution of response error in the reinterview. In the next SASS cycle, we will develop separate reinterview questionnaires for public and private schools, teachers, and administrators, to ensure the reinterview more closely replicates the original interview.

III. Teacher Survey Reinterview Results

We analyzed the responses for 77 questions. For "mark all that apply" questions, each category is treated as a separate question. Table 5 summarizes these response variance results.

Table 5. Response Variance Summary for the 1993-1994 SASS Teacher Survey

Level of response variance	Number
Low	11 (14%)
Moderate	36 (47%)
High	30 (39%)
Total evaluated	77 (100%)
Too few cases to estimate index	15
Total	92

Based on content, we divided these questions into six groups for ease of presentation. In each group we discuss only the questions that exhibited moderate variance (indices between 20 and 50) or high response variance (indices greater than 50):

A. Teaching Assignments and Certificates

We evaluated questions 1, 21, 22, 23, and 24, all regarding teaching assignments and certificates. We tabulated question 24b responses as seven "mentioned/not mentioned" subquestions, using the general headings of the teaching assignment field codes. This group of questions contains 21 subquestions. Only 15 of the subquestions had enough data to estimate the index. Nine of those had moderate or high response variance.

This general problem affects several questions.

Questions 21b - 23a: Question 21b asks public and private school teachers if they teach classes in OTHER fields besides their MAIN field. About one-fourth of the 649 teachers who said they didn't teach other fields, contradicted themselves by failing to mark the "not applicable" box in question 23a.

We think the reason teachers have trouble answering OTHER teaching assignment questions 23a and 21b consistently is because the intervening questions (22 a, b, c) address MAIN teaching assignments.

We recommend implementing the specific improvements suggested in Part 1 of the 1992 Teacher Follow-up Survey Reinterview Report [3]. Group the MAIN teaching assignment questions (21a; 22 a, b, c; and 26 a, b) together and the

OTHER teaching assignment questions (21 b, c and 23 a,b,c) together. Grouping will eliminate the need for respondents to shift their thinking between their MAIN and OTHER teaching assignments.

Here are the specific problems with individual questions.

Question 21b: *Do you teach classes in OTHER fields at this school?*

1 □ Yes
2 □ No

Question 21b is somewhat problematic. It has moderate response variance, with an index of 27.2 (22.7, 32.6). Also, 9.8 (8.1, 11.5) percent of the respondents changed their answers between the original interview and the reinterview.

Question 22a (for public school teachers): *Do you have a teaching certificate in this state in your MAIN teaching assignment field?*

1 □ Yes
2 □ No

Question 22a displayed moderate response variance, with an index of 44.3 (32.5, 60.3).

Question 22b (for public school teachers): *What type of certificate do you hold in this [your MAIN teaching] field?*

Mark (X) only one box.

2 □ Advanced professional certificate

3 □ Regular or standard state certificate

4 □ The certificate offered in your state to persons who HAVE COMPLETED what the state calls 'alternative certification program'

5 □ Provisional or other type given to persons who are still participating in what the state calls an 'alternative certification program'

6 □ Probationary certificate (the initial certificate issued after satisfying all requirements except the completion of a probationary period)

7□ Temporary certificate (requires some additional college coursework and/or student teaching before regular certification can be obtained)

8□ Emergency certificate or waiver (issued to persons with in sufficient teacher preparation who must complete a regular certification program in order to continue teaching)

Question 22b for public school teachers has moderate response variance, with an index of 39.4 (33.9, 46.0). Approximately one-seventh of the teachers gave different answers between the original interview and the reinterview.

To determine if the moderate response variance was caused by too fine a distinction in type of certificate, the first three categories (2 through 4) were combined into one category *(Hold regular certificate or above)*, the next three categories (5 through 7) into one category *(Still needs to complete requirements)*, and the last category *(Emergency certificate or waiver)* left by itself. Combining categories still resulted in moderate response variance, with an index of 36.4 (25.9, 51.2).

Question 23a: *Do you have a teaching certificate in this state in your OTHER teaching assignment field at this school?*

0□ Not applicable; I do not have a second teaching assignment field
1□ Yes
2□ No

Question 23a displays high response variance for both public and private school teachers. The index for public school teachers is 56.9 (52.2, 62.3). For the private school teachers, it is 61.3 (48.9, 79.4). Approximately one-third of the teachers changed their answers between the original interview and the reinterview.

Question 23b (public school teachers): Question 23b is identical to 22b, except it refers to the OTHER teaching assignment field. The question has moderate response variance, with an index of 49.1 (35.1, 70.9). Combining the categories, as done for question 22b, resulted in too few cases to compute an index.

Question 24a: *Do you have any other regular or advanced teaching certificates in this state or in any other state?*

1□ Yes
2□ No

Question 24a has high response variance, 52.4 (47.2, 58.4). It also asks two questions at the same time: (1) Do you have any other regular or advanced certificates and (2) are the certificates in this state or in any other state. Approximately one-fifth of the respondents changed their answers between the original interview and the reinterview.

Question 24b: *In what teaching assignment fields are these certificates? Record the two-digit code from list above.*

This question displays low to moderate response variance. We tabulated it like a "mark-all-that-apply" question, using each of the seven major assignment fields as a "mentioned/not mentioned" category. Results are shown below.

Assignment Field	Index of Inconsistency
General	30.1 (21.8, 42.5)
Special areas	31.9 (23.9, 43.5)
Foreign languages	[Too few cases]
Science	12.2 (5.9, 25.0)
Vocational-technical education	[Too few cases]
Special education	14.3 (7.8, 26.5)
All others	[Too few cases]

B. Chapter I

We reinterviewed question 27, which asks about Chapter 1 status. This question performs reasonably well. Its index, 22.5 (15.8, 32.2), is in the low end of the moderate range. Only 2.5 percent (1.6, 3.4) of the respondents changed their answers between the original interview and the reinterview.

Question 27: *Are you a Chapter 1 teacher (i.e., are you paid in full or in part by federal funds under the Elementary and Secondary Education Act)?*

1 □ Yes
2 □ No

C. Teacher Activities

We reinterviewed teacher activity question 30. The public school teacher version of question 30 differs slightly from the private school teacher version. About half of the subquestions evaluated displayed high response variance (an index over 50).

Question 30 (for public school teachers): *Since the end of last school year, in which of these activities related to teaching have you participated?*

Mark (X) all that apply.

Public School Response Categories	Index of Inconsistency
SCHOOL District sponsored workshops or in-service programs	68.0 (58.7, 78.9)
SCHOOL sponsored workshops or in-service programs	71.4 (63.5, 80.5)
University extension or adult education courses	48.5 (43.3, 54.5)
College courses in your subject field	35.1 (30.5, 40.6)
Professional growth activities sponsored by professional associations	57.1 (52.1, 62.8)
Committee to integrate academic skills into the vocational curriculum	59.0 (51.9, 67.3)
Other curriculum committee	53.6 (48.4, 59.5)
Committee on selecting textbooks or materials	41.7 (36.5, 47.7)
None of the above	[Too few cases]

Private School Response Categories	Index of Inconsistency
Workshops or in-service programs sponsored by an organization with which this school is affiliated	77.2 (61.8, 99.0)
SCHOOL sponsored workshops or in-service programs	[Too few cases]
University extension or adult education courses	52.7 (38.3, 74.6)
College courses in your subject field	12.3 (6.0, 25.3)
Professional growth activities sponsored by professional associations	60.2 (48.4, 76.8)
Committee to integrate academic skills into the vocational curriculum	[Too few cases]
Other curriculum committee	53.3 (40.4, 72.2)
Committee on selecting textbooks or materials	42.8 (32.2, 58.4)
None of the above	[Too few cases]

Some of question 30's response categories may confuse respondents. For example, a respondent who attended a school sponsored workshop at a university could, in the original interview, select the first or third response category above. That same respondent in reinterview might choose the opposite response category.

D. In-Service or Professional Development Programs

We reinterviewed questions 31 and 33 concerning in-service or professional development programs. Question 31 contains five subquestions, each asking the respondents if they participated in a specific program. If the respondent participated in a program, question 31 also asks how long the program lasted. Question 33 is a "mark-all-that- apply" question with six categories.

All 16 of the subquestions in this group of questions have moderate response variance (indices between 20 and 50) or high response variance (indices greater than 50).

Question 31: *Since the end of last school year, have you participated in any in-service or professional development programs which focused on the following topics?*

	Index of Inconsistency	
Response categories	Yes/No	No. hours lasted
Uses of education technology for instruction (e.g., uses of computer, satellite learning)	45.4 (41.0, 50.3)	44.1 (37.3, 52.7)
Methods of teaching your subject field	50.0 (45.3, 55.4)	59.7 (53.8, 66.7)
In-depth study in your subject field	52.0 (46.7, 58.2)	60.7 (52.1, 71.9)
Student assessment (e.g., methods of testing, evaluation, performance assessment)	52.1 (47.4, 57.4)	58.4 (49.3, 69.9)
Cooperative learning in the classroom	45.9 (41.3, 51.1)	53.0 (44.5, 63.8)

Question 31 has moderate to high response variance. Some respondents may not completely understand some of the terms used, such as "satellite learning" and "performance assessment."

Question 33: *What types of support have you received during the current school year for in-service education or professional development in your MAIN teaching assignment field?*

Mark (X) all that apply.

Response categories	Index of Inconsistency
Released time from teaching	51.6 (46.8, 57.2)
Scheduled time (i.e., time built into your schedule for professional development)	62.1 (57.0, 68.0)
Travel and/or per diem expenses	43.7 (38.7, 49.5)
Tuition and/or fees	47.2 (42.0, 53.3)
Professional growth credits	50.5 (45.5, 56.3)
None of the above	87.4 (77.5, 99.0)

All six response categories for question 33 have moderate or high response variance. Again, some respondents may not completely understand some of the terms, such as "released time from teaching" and "professional growth credits."

We suggest that each "mark-all-that-apply" response category for question 33 be written as a separate "yes/no" question and ambiguous terms be replaced or clearly explained.

E. Student Behavior Problems

We reinterviewed student and behavior problem questions 43a, 43b, 46a-n, 49a, 49b, 50, 53b(1), 53b(2), and 54. Twenty of the 21 questions and subquestions with enough data for analysis purposes have moderate response variance (indices between 20 and 50) or high response variance (indices greater than 50).

Question 43: *During your most recent FULL WEEK of teaching -*

a. *How many students in the class(es) you teach were tardy?*

□ *None or _____ students*

b. *How many times did you have to interrupt your class(es) to deal with student misbehavior or disruption?*

□ *None or _____ interruptions*

Because of the time lag between the original interview and the reinterview, a lead-in to the reinterview question was developed which attempted to anchor the teacher's response to the time of the original interview.

As stated on the front of this questionnaire, we received a teacher questionnaire from you a short time ago. Think back to the time you completed that questionnaire. AT THAT TIME, during your most recent FULL WEEK of teaching-

Questions 43a and 43b both had moderate response variance, with indices of 40.0 (28.8, 51.2) and 37.1 (28.9, 45.3), respectively. Note that the reinterview for these questions does not replicate the original interview. A comparison of the means and variances for these quantitative questions substantiates this fact.

A Census Bureau memorandum [9] stated that for these questions "memory recall effects are likely to cause an overestimate of the response variance." Because the recall task in the reinterview is more difficult than in the original interview, we suspect the actual response variance for these questions is lower than the estimates provided.

Question 46: *To what extent is each of the following matters a problem in this school? Indicate whether it is a serious problem, a moderate problem, a minor problem, or not a problem in this school.*

Perception and opinion questions are notorious for having high response variance. Question 46 is no exception, as shown in the first column of table 6. All 14 of the school problems have moderate or high response variance, with indices ranging from 35.5 (32.1, 39.2) for *Student pregnancy* to 62.4 (58.6, 66.8) for *Physical conflicts among students*.

Collapsing the four response categories of question 46 to two categories, "Problem" and "Not a problem," reduced response variance slightly. Table 6 shows the index of inconsistency for the subquestions of question 46 before and after collapsing. Although tabulating data collected in four categories in only two categories improved reliability, we can't guarantee that asking only two response categories would produce similarly reliable data.

Table 6. Indices of Inconsistency for Uncollapsed and Collapsed Problem Categories for Question 46

Subquestions	Index of Inconsistency	
	Four uncollapsed response categories	Collapsed to "Problem" and "Not a problem"
a. Student tardiness	56.5 (52.8, 60.7)	47.9 (42.2, 54.5)
b. Student absenteeism	59.5 (55.9, 63.6)	52.6 (45.9, 60.5)
c. Teacher absenteeism	60.0 (55.8, 64.7)	51.2 (46.7, 56.3)
d. Student cutting class	47.3 (43.6, 51.6)	36.1 (32.1, 40.6)
e. Physical conflicts among students	62.4 (58.6, 66.8)	54.4 (48.8, 60.9)
f. Robbery or theft	60.1 (56.1, 64.6)	47.0 (42.3, 52.4)
g. Vandalism of school property	60.0 (56.1, 64.2)	53.4 (48.3, 59.2)
h. Student pregnancy	35.5 (32.1, 39.2)	19.6 (16.5, 23.4)
I. Student use of alcohol	43.7 (40.3, 47.5)	21.3 (18.1, 25.1)
j. Student drug abuse	46.1 (42.6, 50.1)	22.3 (19.1, 26.2)
k. Student possession of weapons	43.5 (39.6, 48.0)	32.2 (28.4, 36.6)
l. Verbal abuse of teachers	58.5 (54.8, 62.6)	43.0 (38.3, 48.4)
m. Student disrespect for teachers	50.8 (47.3, 54.8)	49.3 (42.8, 56.9)
n. Students dropping out	40.6 (37.2, 44.6)	26.7 (23.2, 30.7)

Question 49a: *Has a student from this school ever threatened to injure you?*

1 ☐ Yes
2 ☐ No

Question 49a has an index of 26.7 (22.3, 32.1), which is somewhat problematic. Terms like "threatened to injure" can be subjective. The same teacher could have a different threshold for reporting an incident, depending upon when asked.

Question 49b: *Has a student threatened to injure you in the past 12 months?*

1 ☐ Yes _ How many times → _____
2 ☐ No

This question is somewhat problematic. About one-fifth of the respondents gave inconsistent answers between the two interviews. The index of inconsistency was 38.9 (30.7, 50.1). However, teachers who in both interviews reported being threatened, were able to report "how often" with good reliability. The index was only 1.5 (0.1, 2.9).

Question 50a: *Has a student from this school ever physically attacked you?*

1 ☐ Yes
2 ☐ No

Question 50a has an index of 25.9 (19.6, 34.2).

F. Teaching Salary and Benefits

We reinterviewed questions 53 and 54 on teaching salaries and benefits. Question 53 contains three subquestions while question 54 has 11 subquestions. Only question 53b2(1) and six of the subquestions in question 54 have moderate response variance (indices between 20 and 50).

Question 53b2(1): *Do you, or will you, earn any additional compensation from this school (or school system, for public school teachers) for extracurricular or additional activities such as coaching, student activity sponsorship, or teaching evening classes?*

1 ☐ Yes
2 ☐ No

Question 53b2(1) has an index of 20.1 (16.8, 24.1).

Question 54: *Which of these benefits do you receive, in whole or in part, from this school (or school district, for public school teachers) in addition to your salary?*

Mark (X) all that apply.

Response Category	Index of Inconsistency
General medical insurance	21.9 (16.9, 28.4)
Dental insurance	12.9 (10.3, 16.2)
Group life insurance	29.9 (26.1, 34.3)
Pension contributions	45.0 (40.3, 50.4)
Housing or housing expenses	[Too few cases]
Meals (including free or reduced-price lunch)	30.9 (22.3, 42.9)
Car/transportation expenses	41.8 (32.9, 53.1)
Reimbursement for tuition and course fees	33.7 (29.2, 39.0)
Tuition for your children	[Too few cases]
Child care	[Too few cases]
None of the above	[Too few cases]

No matter how simple a question is, if it is asked as a "mark-all-that-apply," it rarely will have low response variance. Consider question 54. One would expect a respondent to know the employee benefits he or she receives and answer consistently between the original interview and the reinterview. Yet only the *Dental insurance* showed good reliability with an index of 12.9 (10.3,16.2). Like the other "mark-all-that-apply" questions, we suggest that each response category for question 54 be written as a separate "yes/no" question.

IV. School Survey Reinterview Results

We analyzed the responses from 555 schools on 122 questions. Table 7 summarizes these response variance results.

Table 7. Response Variance Summary for the 1993-1994 SASS School Survey

Level of response variance	Number
Low	70 (57%)
Moderate	42 (34%)
High	10 (8%)
Subtotal	122 (100%)
Too few cases to estimate index	14
Total	136

Based on content, we divided these questions into four sections. We discuss only the questions that exhibit moderate response variance (indices between 20 to 50) or high response variance (indices greater than 50).

When two question numbers appear and are separated by a forward slash, the first number refers to the private school original questionnaire while the second refers to the public school original questionnaire. For example, question 6/7 is question 6 on the private school original questionnaire and question 7 on the public school original questionnaire.

A. Student Enrollment

We reinterviewed student enrollment questions 6/7, 7/8, and 8/9. Questions 6/7 and 8/9 contain 33 subquestions. Only one of the 33 subquestions with enough data for analysis purposes has moderate response variance -- subquestion 6a(1)/7a(1), the "grades offered" part. That subquestion has an index of 37.8 (28.2, 50.8).

Question 6/7: *How many students were enrolled in each of the grades shown on the front page, plus any ungraded levels, around the first of October?*

	Index of Inconsistency	
Grade Levels	Grades offered	Enrollment
Ungraded (including ungraded special education students)	37.8 (28.2, 50.8)	2.5 (0.0, 5.1)
Kindergarten	2.6 (1.2, 5.3)	0.4 (0.2, 0.6)
1st	4.6 (2.7, 7.9)	0.2 (0.2, 0.2)
2nd	3.1 (1.6, 5.9)	1.2 (1.0, 1.4)
3rd	4.1 (2.3, 7.2)	0.2 (0.0, 1.9)
4th	6.1 (3.8, 9.8)	0.3 (0.1, 0.5)
5th	5.1 (3.1, 8.5)	0.2 (0.0, 0.4)
6th	5.8 (3.6, 9.6)	0.4 (0.0, 0.9)
7th	7.5 (4.9, 11.6)	0.1 (0.1, 0.1)
8th	6.9 (4.4, 10.9)	0.1 (0.1, 0.1)
9th	5.5 (3.3, 9.2)	0.2 (0.0, 0.4)
10th	5.6 (3.3, 9.3)	0.2 (0.0, 0.4)
11th	4.5 (2.5, 7.9)	0.4 (0.2, 0.6)
12th	5.1 (2.9, 8.7)	0.5 (0.3, 0.7)

Two problems might exist with question 6/7.

- The term "ungraded" may not be clear.
- The question stem does not instruct respondents to mark the "grades offered" box. Some respondents might feel that providing an enrollment count automatically indicates that the grade is offered. We checked three grades: ungraded, fourth, and tenth. Between 37 and 49 percent of the schools returning mail questionnaires entered enrollment counts but did

not mark the "grade offered" box. None of the CATI interviews experienced this problem.

This problem has little effect on the final quality of these data because computer edits can fix it. More problematic is the situation when a school has no enrollment in an offered grade and fails to mark the "grade offered" box.

Our recommendations:

- Define "Ungraded" more clearly, if possible.
- Develop a more user-friendly method to determine whether a grade is offered but has no students.

B. Part-time / Full-time Teachers and Other Staff

We reinterviewed school staff questions 16, 17, and 18 from the original public school questionnaire and questions 21, 22, 23, and 24 from the original private school questionnaire. These questions contain 49 subquestions with enough data to estimate the index of inconsistency. Twenty of these questions had moderate response variance (indices between 20 to 50) or high response variance (indices greater than 50).

Questions 16 and 17: These questions ask public schools about part-time and full-time staff, respectively. These questions showed fairly good reliability. They all displayed low or moderate response variance, with indices below 50.

The stem for question 16 reads:

How many staff held PART-TIME positions in this school in each of the following categories around the first of October?

Report only for the grade range shown on the front page.
Please read through all of the categories listed below before starting to answer.

INCLUDE AS PART TIME:

- *Employees who work part time.*
- *Employees you share with other schools within or outside of the school district.*
- *Employees who perform more than one function at this school; for example, a teaching principal would be counted once as a part-time teacher and again as a part-time principal.*

The stem for question 17 reads:

How many staff held FULL-TIME positions in this school in each of the following categories around the first of October?

Report only for the grade range shown on the front page
Please read through all of the categories listed below before starting to answer.

The response categories and indices of inconsistency for questions 16 and 17 are given below.

Response Categories (for questions 16 and 17)	Index of Inconsistency	
	Part-time (question 16)	Full-time (question 17)
Principals	21.9 (15.2, 31.6)	21.6 (15.1, 30.9)
Vice principals and assistant principals	25.9 (17.0, 39.6)	4.8 (1.7, 7.9)
Instructional coordinators and supervisors, such as curriculum specialists	13.4 (2.5, 24.3)	23.3 (4.5, 42.1)
School counselors	22.9 (18.4, 28.7)	2.7 (1.5, 3.9)
Library media specialists/librarians	24.3 (18.7, 31.5)	15.8 (12.2, 20.6)
Student support services professional staff, such as school psychologists, social workers, occupational therapists, speech therapists, and nurses	42.7 (35.5, 49.9)	40.0 (27.2, 52.8)
Teachers	27.7 (21.0, 34.4)	3.2 (0.6, 5.8)
Library media center aides	34.8 (28.6, 42.6)	25.5 (21.0, 31.1)
Teacher aides	14.2 (8.6, 19.8)	10.2 (3.5, 16.9)
Secretaries and other clerical support staff	27.5 (12.0, 43.0)	5.2 (3.7, 6.7)
Other employees (e.g., cafeteria workers, maintenance staff, etc.)	35.8 (24.6, 47.0)	24.0 (17.1, 30.9)

Questions 21 and 22: These questions ask private schools about part-time and full-time staff, respectively. Only five of the 11 part-time positions and seven of the 11 full-time positions had enough cases to estimate the index.

As with the public school questions, these questions showed fairly good reliability. Only the responses for part-time *"Principals/school heads"* displayed high response variance (an index greater than 50).

The stem for question 21 reads:

How many staff held PART-TIME positions in this school in each of the following categories around the first of October?

Report only for the grade range shown on the front page.
Please read through all of the categories listed below before starting to answer.

INCLUDE AS PART TIME:

- *Employees who work part time.*
- *Employees you share with other schools.*
- *Employees who perform more than one function at this school; for example, a teaching principal would be counted as a part-time principal in this item.*

DO NOT INCLUDE TEACHERS IN THIS ITEM unless they also have some other position (administrator, counselor, etc.) at this school. You will report teachers in later items.

The stem for question 22 reads:

How many staff held FULL-TIME position in this school in each of the following categories around the first of October?

Report only for the grade range shown on the front page.
Please read through all of the categories listed below before starting to answer.

DO NOT REPORT TEACHERS IN THIS ITEM. You will report them in later items.

The response categories and indices of inconsistency for questions 21 and 22 are given below.

Response Categories (for questions 21 and 22)	Index of Inconsistency	
	Part-time (question 21)	Full-time (question 22)
Principals/school heads	51.3 (26.0, 76.6)	33.7 (22.7, 52.3)
Vice principals and assistant principals	[Too few cases]	24.3 (15.0, 41.7)
Other managers, such as a business manager	[Too few cases]	3.8 (0.0, 8.1)
Instructional coordinators and supervisors, such as curriculum specialists	[Too few cases]	[Too few cases]
School counselors	[Too few cases]	[Too few cases]
Library media specialists/librarians	[Too few cases]	18.0 (9.8, 33.3)
Student support services professional staff, such as school psychologists, social workers, occupational therapists, speech therapists, and nurses	19.0 (4.4, 33.6)	[Too few cases]
Library media center aides	[Too few cases]	[Too few cases]
Teacher aides	30.8 (2.8, 58.8)	14.4 (0.0, 33.6)
Secretaries and other clerical support staff	18.3 (9.9, 33.8)	4.4 (0.3, 8.5)
Other employees (e.g., cafeteria workers, maintenance staff, etc.)	18.3 (7.3, 29.3)	2.6 (0.1, 5.1)

Question 23 (private schools): *How many persons holding teaching positions at this school were teaching in the grades shown on the front page of this questionnaire and the COMPARABLE ungraded levels around October 1, 1993?*

Do not include short-term substitute teachers, student teachers, teacher aides, or day care aides. Include only filled positions; do not count vacant positions. Consider only the amount of time an individual works as a teacher during a typical week at this school.

Response Categories	Index of Inconsistency
Full-time teachers	0.8 (0.1, 1.5)
Teach at least ¾ time but less than full time	30.8 (6.0, 55.6)
Teach at least ½ time but less than ¾ time	13.6 (0.1, 27.1)
Teach at least ¼ time but less than ½ time	15.0 (3.8, 26.2)
Teach less than ¼ time	45.0 (32.3, 66.4)
Total Teachers	0.4 (0.1, 0.7)

Question 23 is asked of private schools. Although none of question 23's response categories has high response variance, two response categories have moderate response variance. Response category 2, *"...Teach at least ¾ time but less than full time,"* has an index of 30.8 (6.0, 55.6); response category 5, *"...Teach less than ¼ time,"* has an index of 45.0 (32.3, 66.4). This response variance may be caused by asking for a too detailed breakdown of part-time categories. Collapsing question 23 into three categories improved reliability dramatically.

Response Categories	Index of Inconsistency
Full-time teachers	0.8 (0.1, 1.5)
Teach at least ½ time but less than full-time	4.3 (0.5, 8.1)
Teach less ½ time	11.5 (4.4, 18.6)

These results seem promising, but we can't guarantee that respondents will answer this three-category question with this same reliability. If these broader part-time categories are acceptable to the NCES, it would be useful to test this question. Or

the NCES can continue to ask the five-category question, but publish only the three collapsed categories.

C. Student Programs and Services

We reinterviewed the student programs and services questions 33/21, 37/25, 39a/27a, 40/28, and 41/29. All questions except, 39a/27a, contain subquestions.

Twelve of the 19 subquestions have moderate response variance (indices between 20 to 50) or high response variance (indices greater than 50). Question 33c/21c contains seven of those subquestions; question 40/28, three; and question 41/29, two.

Question 33c/21c: *Which of the following methods are used by this school (or the school district, for public schools) to determine whether a student is limited English proficient?*

Mark (X) all that apply.

Response Categories	Index of Inconsistency
Recommendation by parent	56.9 (47.7, 68.8)
Teacher observation or referral	53.9 (43.0, 68.6)
Home language survey or assessment	29.6 (22.7, 39.2)
Written language exam	32.8 (25.5, 42.7)
Oral interview in native language	41.7 (33.7, 52.3)
Previous student record	59.1 (49.0, 72.4)
Achievement test results	52.8 (43.3, 65.3)

All seven of the response categories for question 33c/21c have moderate or high response variance. Since question 33c/21c is a "mark-all-that-apply" question, this result is not surprising. We recommend writing each response category for this question as a separate "yes/no" question.

Question 40b/28b: *Regardless of whether this school participates in the National School Lunch Program, around the first of October, were any students in this school ELIGIBLE for the program?*

1 □ Yes
2 □ No
3 □ Don't know

Question 40b/28b has moderate response variance with an index of 33.6 (26.3, 43.0). The GDR was 8.6 (6.5, 10.6). The cross-tabulations show that when the respondents changed their responses from the original interview to the reinterview they always switched from "yes" to "don't know" or "no" to "don't know." They never switched from "yes" to "no" or vice versa.

Participation in the National School Lunch Program may allow respondents to better judge whether any students at the school are eligible for the program. The respondents whose schools participated in the National School Lunch Program answered more consistently between the original interview and the reinterview. Of the 444 respondents who consistently responded that their schools participated in the National School Lunch Program, only 3.7 percent changed their answers about student eligibility. In contrast, 32.9 percent of the 88 respondents who consistently responded that their school did NOT participate in the program changed their answers about eligibility.

Question 40c/28c: *Around the first of October, how many applicants at this school were approved for the National School lunch Program?*

Report a separate count for prekindergarten-age children.

Response Categories	Index of Inconsistency
Prekindergarten applicants approved	25.1 (8.3, 41.9)
Other applicants approved (Kindergarten level or higher)	22.2 (8.2, 36.2)

Both response categories of questions 40c/28c have moderate response variance.

Question 41b/29b: *Does this school offer job placement services for graduating seniors?*

1 □ Yes
2 □ No

Question 41b/29b displayed moderate response variance, with an index of 48.9 (38.7, 62.8). The GDR showed that 16.8 (12.7, 21.0) percent of 220 respondents changed their answers from the original interview to the reinterview.

Question 41c/29c: *Does this school have a "Tech-Prep" program, i.e., vocational-technical instruction in the last two years of high school designed to prepare students for two years of vocational instruction at the postsecondary level?*

1 □ Yes
2 □ No

Question 41c/29c has moderate variance, with an index of 34.0 (26.9, 43.5). Possibly respondents are confused about what to consider a "Tech-Prep" program, despite the definition given in the question's stem. The definition is very long and respondents may not read it all. The GDR showed that 16.9 (12.8, 21.0) percent of 225 respondents changed their responses between the original interview and the reinterview.

D. School Policies

We reinterviewed school policy questions 46a/31a, 46b/31b and 46c/31c. These questions contain 22 subquestions. All 19 of the subquestions with enough data have moderate (indices between 20 and 50) or high response variance (indices greater than 50).

Question 46a/31a: *Does this school have a drug, alcohol, and/or tobacco use preventive program?*

Response Categories

1 □ Yes
2 □ No

Question 46a/31a has moderate response variance with an index of 40.4 (30.5, 53.5).

Question 46b/31b: *Which of the following types of activities are included as part of this school's drug, alcohol, and/or tobacco use prevention program?*

Mark (X) all that apply.

Response Categories	Index of Inconsistency
Teaching students about causes and effects of:	
Alcohol use	[Too few cases]
Drug use	[Too few cases]
Smoking or chewing tobacco	[Too few cases]
Teaching students about laws regarding:	
Alcohol possession, purchase, and use	46.2 (37.6, 57.2)
Drug possession, sales, distribution, and use	48.4 (39.8, 59.3)
Tobacco, possession, purchase, and use	49.0 (40.8, 59.2)
School policy and enforcement for:	
Alcohol possession, use	44.0 (33.6, 57.7)
Drug possession, sales, use	43.3 (32.9, 56.9)
Tobacco possession, use	47.7 (37.0, 61.5)
Teaching students the skills to resist peer pressure	68.4 (55.6, 84.7)
Peer counseling	43.6 (38.0, 50.4)
School services for high-risk students	49.2 (42.9, 56.7)
Student assistance programs	44.8 (39.0, 51.6)
Referrals to counseling and treatment	47.0 (39.3, 56.5)
Student drug-testing programs	48.3 (37.2, 62.8)

Question 46c/31c: *In which of the following ways does this school provide the drug, alcohol, and/or tobacco use prevention program?*

Mark (X) all that apply.

Response Categories	Index of Inconsistency
In health curriculum	38.1 (29.8, 48.8)
In science curriculum	53.8 (47.3, 61.5)
Separate course	50.3 (43.8, 58.0)
Throughout curriculum	51.9 (45.8, 59.1)
Special assemblies	43.0 (36.6, 50.9)
Other	61.1 (54.4, 69.1)

Questions 46a/31a, 46b/31b, and 46c/31c all have moderate or high response variance. The problems include:

- Questions 46a/31a don't define "prevention program."
- Some of the individual subquestions of 46b/31b ask about multiple characteristics, for example, "Drug possession, sales, distribution, and use."
- Questions 46b/31b combine the concepts of policy and enforcement. This combination doesn't allow the respondent to report one answer regarding school policy and a different answer regarding enforcement. Finally, the category "policy and enforcement" doesn't fit well as an "activity."
- The last five response subquestions of 46b/31b use terms or phrases that should be defined or explained, such as "peer counseling," "skills to resist peer pressure," "school services for high-risk students," and "student assistance programs."
- Questions 46b/31b and 46c/31c are "mark-all-that-apply" questions.

To reduce response variance, we suggest the following revisions be considered for questions 46a/31a, 46b/31b, and 46c/31c.

- Define terms that can be misinterpreted.
- Treat drug, alcohol, and tobacco separately.
- Change question from a "mark-all-that-apply" to a series of "yes/no" questions.

V. Administrator Survey Reinterview Results

Table 8 summarizes response variance for the 75 Administrator Survey questions evaluated.

Table 8. Response Variance Summary for the 1993-1994 SASS Administrator Survey

Level of response variance	Number
Low	29 (39%)
Moderate	11 (15%)
High	35 (47%)
Total evaluated	75 (100%)
Too few cases to estimate index	6
Total	81

We divided the reinterview questions into five groups, based on content. In each group we discuss only the questions that exhibited moderate response variance (indices between 20 and 50) or high response variance (indices greater than 50).

A. Master's Degrees/Major Fields of Study

We reinterviewed the master's degree/major field of study questions 8 and 9. Questions 8 and 9 each consist of subquestions a, b, and c. Four subquestions, 8b, 9a, 9b, and 9c, have moderate or high response variance.

Question 8b: *What was your major field of study?*
Record the two-digit field code from the list on page 3 and the field name.

This question has moderate response variance, with an index of 35.3, (31.8, 39.2). Many of the administrators had difficulty recording their major field of study. Approximately, one out of every five administrators provided different major fields of study in the original interview and reinterview.

- "Special Education" is the only major field of study that looks good. It has an index of 8.3 (4.7, 14.8).

- Five major fields of study have moderate response variance.

Major field	Index of Inconsistency
General Education	42.9 (37.0, 50.0)
Subject Area Education	42.1 (34.9, 50.7)
Other Education	32.2 (28.3, 36.6)
General Fields	31.1 (21.1, 45.7)
Social Science	37.5 (24.6, 57.1)

- "General Education," "Subject Area Education," and "Other Education" had significant NDRs, suggesting the reinterview did not adequately replicate the original interview. We believe a "context effect" in the reinterview might have caused these significant NDRs. Many administrators might not have read the question carefully and assumed, like in the original interview, the first reinterview questions asked for information about their bachelor's degree.

  We examined the responses for the 95 administrators, who in the interview, gave "Other Education" for their master's degree major field of study and "General Education" or "Subject Area Education" for their bachelor's degree major field of study.

  About 53 percent of these administrators reported in the reinterview as their master's degree major field, the same major field of study they reported for their bachelor's degree in the original interview.

  To closer replicate the original interview, we recommend that bachelor's degree questions (5, 6, and 7) on the original questionnaire be added to the reinterview questionnaire and asked before the master's degree questions.

Question 9a: *Do you have a second master's degree?*

1 □ Yes
2 □ No

This question has moderate response variance, with an index of 26.3 (21.0, 32.9) and a GDR of 6.6 (5.1, 8.0). This question also has a statistically significant

NDR. We believe the "context" problem may have carried over from question 8 to questions 9a through 9c.

Question 9b: *What was your major field of study?*

code *Major field*

"Other Education" was the only major field in question 9b with enough data to compute the index. The index was 51.1 (37.5, 72.0), denoting high response variance. The GDR was 20.2 (14.8, 28.5).

Question 9c: *In what year did you receive your second master's degree?*

1	9		

This question has moderate response variance with an index of 31.6 (23.2, 44.5) and a GDR of 20.4 (13.6, 27.3).

B. Principal/Other School Positions Held

We reinterviewed the principal/other school position questions 13, 14, 16, and 17. Questions 14 and 17 contain 19 subquestions.

Only question 14 has moderate or high response variance. It has an "a" part, a "b(part 1)," and a "b(part 2)." The "a" part, five of the eight subquestions in "b(part 1)," and three of the eight subquestions in b(part 2) have moderate (indices between 20.0 and 50.0) or high response variance (indices greater than 50.0).

Question 14a: *Did you hold any other school position BEFORE you became a principal?*

1 □ Yes
2 □ No

Although this question appears to be straightforward, it has a high index of 67.6 (61.4, 74.7) and a GDR of 23.4 (21.1, 25.7). Question 14a also has a significant NDR of -18.2 (-20.8, -15.6). A possible cause of this high response variance might be confusion about whether the question refers to the respondent's current school or all schools. The question preceding 14a refers to the current school, but question 14a does not specify which school.

We investigated why the NDR was so large. In the reinterview, a higher percentage of respondents answered "Yes" than in the original interview (88 percent versus 70 percent). We hypothesized that in the original interview, mail respondents might tend to choose "No" to avoid answering the next eight questions. The mail respondents could see that a "Yes" response would require them to answer eight more questions. In the reinterview, the questionnaire was short enough that respondents did not try to avoid those eight questions.

Cross-tabulations of the question 14a responses, separated by mail and telephone, support that hypothesis. The NDR among mail respondents -21.6 (-18.4, -24.8) was significantly higher than among telephone respondents -8.1 (-3.7, -12.5). However, the significant NDR among telephone respondents remains puzzling.

Question 14b(part 1): *Which of the following school positions did you hold before becoming a principal?*

Response Categories	Index of Inconsistency
Department Head	25.6 (20.8, 31.9)
Curriculum specialist or coordinator	23.9 (18.8, 30.7)
Assistant principal or program director	22.7 (17.4, 29.6)
Guidance Counselor	12.1 (8.0, 18.5)
Library media specialist/Librarian	[Too few cases]
Athletic coach	14.0 (10.4, 18.8)
Sponsor for student clubs, debate teams	32.5 (27.1, 39.2)
Other	57.6 (50.4, 66.3)

As shown above, only "Guidance Counselor" and "Athletic coach" displayed low response variance (an index below 20).

Each of the eight subquestions in part 1 should have been answered by all 707 respondents who answered "yes" to 14a. However, we received answers from between only 342 and 548 respondents. We hypothesize that some respondents did not answer the subquestions for positions they did not hold. If this hypothesis is correct, item nonresponse might be coded as "no."

Question 14b(part 2): *Before becoming a principal, how many years did you hold each position you marked "Yes" in question 14b(part 1)?*

Count part of a year as 1 year.

Three response categories have moderate response variance: "Curriculum specialists or coordinators," "Sponsors for student clubs, debate teams," and "Other." The indexes for these categories are 25.3(14.9, 35.7), 20.3 (15.0, 25.6), and 49.8 (33.7, 65.9), respectively.

C. Location of and Grade Levels Offered at Last School Served

We reinterviewed the location and grade levels questions 18a (public), 18a (private), and 18c. Although Question 18c is a "mark-all-that-apply" question, it has good reliability. Only "Prekindergarten" has moderate response variance, with an index of 22.9 (16.8, 31.2). The rest have low response variance.

Question 18c: *In what grade levels were the students in the school in which you LAST served as principal?*

Mark (X) all that apply.

Response Categories	Index of Inconsistency
Ungraded	[Too few cases]
Prekindergarten	22.9 (16.8, 31.2)
Kindergarten	15.7 (11.8, 20.9)
1st	13.1 (9.6, 18.0)
2nd	14.1 (10.4, 19.2)
3rd	14.2 (10.5, 19.2)
4th	14.1 (10.4, 19.1)
5th	15.1 (11.2, 20.2)
6th	19.7 (15.3, 25.3)
7th	15.1 (11.3, 20.2)
8th	16.0 (12.1, 21.2)
9th	14.9 (10.9, 20.3)

Response Categories	Index of Inconsistency
10th	11.5 (8.1, 16.5)
11th	12.7 (9.0, 17.9)
12th	13.3 (9.5, 18.6)

We obtained a similar finding when we analyzed question 6 (private) and question 7 (public) on the School questionnaires. All grade levels on the School questionnaires have low response variance, except the ungraded which has moderate response variance .

D. Breaks in Service Before and After Becoming Principal

Question 19, "breaks in service," had low response variance (index below 20).

E. Amount of Influence

We reinterviewed questions 25d, e, f for public and private school administrators. Respondents indicate on a scale of 0 to 5 how much influence certain groups and persons have on certain activities. The six questions have 32 subquestions. All the subquestions evaluated had high response variance (index above 50).

Questions 25d, e, f (public school administrators): *"Using the scale 0-5, where 0 is 'None' and 5 is 'A great deal,' indicate how much ACTUAL influence you think each group or person has on decisions concerning the following activities.*

Response categories	Index of Inconsistency
Deciding how the school budget will be spent	
State Department of Education	85.2 (82.0, 88.8)
School district staff	86.8 (83.5, 90.6)
School board	81.8 (78.1, 56.0)
Principal	75.9 (72.1, 80.2)
Teachers	81.6 (78.1, 85.5)
Library media specialists/Librarians	80.8 (77.5, 84.6)
Parent association	75.4 (71.7, 79.6)

Response categories	Index of Inconsistency
Determining content of in-service programs	
State Department of Education	78.5 (75.1, 82.3)
School district staff	79.9 (76.0, 84.3)
School board	83.1 (79.7, 87.0)
Principal	72.3 (68.2, 76.9)
Teachers	73.5 (69.4, 78.1)
Parent association	76.5 (72.7, 80.8)
Evaluating teachers	
State Department of Education	73.5 (70.0, 77.4)
School district staff	79.3 (76.0, 83.0)
School board	78.4 (75.0, 82.1)
Principal	73.8 (66.9, 81.7)
Teachers	79.1 (75.7, 82.9)
Parent association	70.8 (66.2, 75.9)

Questions 25 d, e, f (for private school administrators): *"Using the scale 0-5, where 0 is 'None' and 5 is 'A great deal,' indicate how much ACTUAL influence you think each group or person has on decisions concerning the following activities.*

Response Categories	Index of Inconsistency
Deciding how the school budget will be spent	
Governing/Diocesan board	74.4 (67.1, 83.7)
Principal/School head	63.7 (54.0, 76.2)

Response Categories	Index of Inconsistency
Teachers	77.2 (70.4, 86.0)
Library media specialists/Librarians	72.8 (65.6, 82.2)
Parent association	72.3 (64.5, 82.4)
Determining content of in-service programs	
Governing/Diocesan board	75.9 (69.4, 84.5)
Principal/School head	65.3 (53.3, 81.3)
Teachers	71.3 (63.8, 81.4)
Parent association	81.9 (74.1, 92.0)
Evaluating Teachers	
Governing/Diocesan board	77.8 (70.8, 86.8)
Principal/School head	[Too few cases]
Teachers	71.0 (64.4, 79.5)
Parent association	65.6 (56.2, 77.8)

The indices for these subquestions ranged from 63.7 to 86.8. For 27 of these subquestions at least half the respondents changed their answers between the two interviews. Clearly, the response variances and the GDRs strongly suggest that administrators are very inconsistent in reporting how much influence specific persons and groups have in deciding how the budget will be spent, determining the content of in-service programs, or evaluating teachers. These results are not surprising. Opinion questions are not noted for good reliability.

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Response Variance Formulas

- Original Percentage — the percentage of original responses in a specific answer category. The formula is:

$$P_o = [(a+c)/n] \times 100$$

- Reinterview Percentage — the percentage of reinterview responses in a specific answer category. The formula is:

$$P_r = [(a+b)/n] \times 100$$

- Net Difference Rate (NDR) — the difference between the original percent in a specific answer category and the reinterview percent in that category. The net difference rate measures the net effect of responses changing into and out of that category. The formula is:

$$\begin{aligned} NDR &= P_o - P_r \\ &= [[(a+c) - (a+b)]/n] \times 100 \\ &= [(c-b)/n] \times 100 \end{aligned}$$

- Gross Difference Rate (GDR) — the percentage of the responses which change into or out of a specific answer category. The formula is:

$$GDR = [(b+c)/n] \times 100$$

- Simple Response Variance — the average variance of responses from the same units to the same question over repeated interviews. The simple response variance equals half of the GDR (expressed as a proportion). The formula is:

$$SRV = (b+c)/2n$$

- Index of Inconsistency — the ratio (scaled as a percentage) of simple response variance to the total population variance for a characteristic. The index represents the proportion of the total population variance for a characteristic caused by simple response variance.

For categorical data, when $P = P_o = P_r$, the formula is:

$$\text{Index} = [SRV/P(1-P)] \times 100 = [[(b+c)/2n] / P(1-P)] \times 100$$

where the total population variance for the characteristic is P(1-P).

For quantitative data, the index equals 1 - R, where R is the reliability coefficient, a measure of reliability used in test theory. R is equal to the correlation between original interview and reinterview values, as follows:

$$R = \rho_{y_{t1}y_{t2}} = \frac{Cov(y_{t1}, y_{t2})}{\sqrt{Var(y_{t1})Var(y_{t2})}}$$

- Aggregate GDR — the percentage of people who change their answers to a question.

  $GDR_{AG} = 1 - \sum_i P_{ii}$

  where P_{ii} = proportion of respondents in category *i* in both the original and reinterview.

- Aggregate Index of Inconsistency — an average of indices of inconsistency across all categories of the question, weighted by the proportion of cases in each category.

  $Index_{AG} = 1 - \sum_i P_{i.} \times P_{.i}$

  where $P_{i.}$ = the proportion of respondents in category *i* in the original interview
  $P_{.i}$ = the proportion of respondents in category *i* in the reinterview

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97-28 (Oct.)	Comparison of Estimates in the 1996 National Household Education Survey	Kathryn Chandler
97-29 (Oct.)	Can State Assessment Data be Used to Reduce State NAEP Sample Sizes?	Steven Gorman
97-30 (Oct.)	ACT's NAEP Redesign Project: Assessment Design is the Key to Useful and Stable Assessment Results	Steven Gorman
97-31 (Oct.)	NAEP Reconfigured: An Integrated Redesign of the National Assessment of Educational Progress	Steven Gorman
97-32 (Oct.)	Innovative Solutions to Intractable Large Scale Assessment (Problem 2: Background Questionnaires)	Steven Gorman
97-33 (Oct.)	Adult Literacy: An International Perspective	Marilyn Binkley
97-34 (Oct.)	Comparison of Estimates from the 1993 National Household Education Survey	Kathryn Chandler
97-35 (Oct.)	Design, Data Collection, Interview Administration Time, and Data Editing in the 1996 National Household Education Survey	Kathryn Chandler
97-36 (Oct.)	Measuring the Quality of Program Environments in Head Start and Other Early Childhood Programs: A Review and Recommendations for Future Research	Jerry West

Listing of NCES Working Papers to Date--Continued

Number	Title	Contact
97-37 (Nov.)	Optimal Rating Procedures and Methodology for NAEP Open-ended Items	Steven Gorman
97-38 (Nov.)	Reinterview Results for the Parent and Youth Components of the 1996 National Household Education Survey	Kathryn Chandler
97-39 (Nov.)	Undercoverage Bias in Estimates of Characteristics of Households and Adults in the 1996 National Household Education Survey	Kathryn Chandler
97-40 (Nov.)	Unit and Item Response Rates, Weighting, and Imputation Procedures in the 1996 National Household Education Survey	Kathryn Chandler
97-41 (Dec.)	Selected Papers on the Schools and Staffing Survey: Papers Presented at the 1997 Meeting of the American Statistical Association	Steve Kaufman
97-42 (Jan. 1998)	Improving the Measurement of Staffing Resources at the School Level: The Development of Recommendations for NCES for the Schools and Staffing Survey (SASS)	Mary Rollefson
97-43 (Dec.)	Measuring Inflation in Public School Costs	William J. Fowler, Jr.
97-44 (Dec.)	Development of a SASS 1993-94 School-Level Student Achievement Subfile: Using State Assessments and State NAEP, Feasibility Study	Michael Ross
98-01 (Jan.)	Collection of Public School Expenditure Data: Development of a Questionnaire	Stephen Broughman
98-02 (Jan.)	Response Variance in the 1993-94 Schools and Staffing Survey: A Reinterview Report	Steven Kaufman

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